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5 UNITED STATES DISTRICT COURT
6 WESTERN DISTRICT OF WASHINGTON
7 AT SEATTLE

8 UNITED STATES OF AMERICA, et al.,

9 Plaintiffs,

10 v.

11 STATE OF WASHINGTON, et al.,

12 Defendants.

CASE NO. CV 70-9213

Subproceeding 01-01

MEMORANDUM AND DECISION

13
14 This matter was initiated by a Request for Determination (“Request”) filed in 2001 by plaintiffs
15 Suquamish Indian Tribe, Jamestown S’Klallam, Lower Elwha Band of Klallam, Port Gamble Clallam,
16 Nisqually Indian Tribe, Nooksack Tribe, Sauk-Suiattle Tribe, Skokomish Indian Tribe, Squaxin Island
17 Tribe, Stillaguamish Tribe, Upper Skagit Tribe, Tulalip Tribe, Lummi Indian Nation, Quinault Indian
18 Nation, Puyallup Tribe, Hoh Tribe, Confederated Bands and Tribes of the Yakama Indian Nation,
19 Quileute Indian Tribe, Makah Nation, and Swinomish Tribal Community, and Muckleshoot Indian Tribe
20 (hereafter, “the Tribes”). Plaintiff United States of America joined in the request. The Request for
21 Determination, filed pursuant to the Permanent Injunction in this case, asked the Court to find that the
22 State of Washington has a treaty-based duty to preserve fish runs, and sought to compel the State to
23 repair or replace culverts that impede salmon migration to or from spawning grounds.

24 On August 23, 2007, the Court ruled on cross-motions for summary judgment, finding in favor
25 of the Tribes and declaring that

26 the right of taking fish, secured to the Tribes in the Stevens Treaties, imposes a duty upon
27 the State to refrain from building or operating culverts under State-maintained roads that

28 MEMORANDUM AND DECISION - 1

1 hinder fish passage and thereby diminish the number of fish that would otherwise be available
2 for Tribal harvest. The Court further declares that the State of Washington currently owns
and operates culverts that violate this duty.

3 Order on Cross-Motions for Summary Judgment. Dkt. # 392, p. 12. The matter was then set for a bench
4 trial on remedies.

5 The trial was held over seven days in October 2009, and final argument was heard on June 7,
6 2010. The Court has delayed its ruling in the hope that the parties would resume their settlement
7 negotiations, but it does not appear that has occurred. The Court directed the parties to file
8 supplemental memoranda on the current status of the matter by February 1, 2013. Dkt. # 733. Having
9 considered the testimony and exhibits submitted at trial, together with the final arguments and
10 supplemental memoranda, the Court now issues its Findings of Fact and Conclusions of Law.

11 FINDINGS OF FACT

12 1. This is a designated subproceeding of *United States v. Washington*, C70-9213, based on
13 language in the 1855 Treaty of Point Elliot in which the Tribes were promised that “[t]he right of taking
14 fish at all usual and accustomed grounds and stations, is further secured to said Indians, in common with
15 all citizens of the Territory.” During the negotiations leading up to the signing of the treaties, Governor
16 Issac Stevens and other negotiators assured the Tribes of their continued access to their usual fisheries.
17 Declaration of Richard White, Dkt. # 296, ¶¶ 8, 9, 11. Governor Stevens assured the Tribes that even
18 after they ceded huge quantities of land, they would still be able to feed themselves and their families
19 forever. As Governor Stevens stated, “I want that you shall not have simply food and drink now but that
20 you may have them forever.” *Id.*, ¶ 14. Both the negotiators and the Tribes believed that the fisheries
21 were inexhaustible. *Id.* Thus, during the negotiations, the “Indians, like whites, assumed that their
22 cherished fisheries would remain robust forever.” Declaration of Joseph Taylor III, Dkt. # 297, ¶ 7.

23 2. In construing the treaty, the Supreme Court found that

24 Governor Stevens and his associates were well aware of the “sense” in which the Indians
25 were likely to view assurances regarding their fishing rights. During the negotiations, the
26 vital importance of the fish to the Indians was repeatedly emphasized by both sides, and
27 the governor’s promises that the treaties would protect that source of food and commerce
were crucial in obtaining the Indians’ assent. It is absolutely clear, as Governor Stevens
himself said, that neither he nor the Indians intended that the latter “should be excluded

from their ancient fisheries”, and it is accordingly inconceivable that either party deliberately agreed to authorize future settlers to crowd the Indians out of any meaningful use of their accustomed places to fish.

State of Washington v. Washington State Commercial Passenger Fishing Vessel Association, 443 U.S. 658, 677 (1979) (citations omitted).

3. The following facts are admitted by the parties:¹

SALMON BIOLOGY AND FISH PASSAGE

3.1 In 1973, biologists from some of the parties to this case prepared a Joint Statement Regarding the Biology, Status, Management, and Harvest of the Salmon and Steelhead Resources of the Puget Sound and Olympic Peninsular Drainage Areas of Western Washington. The parties submitted it to this Court as Joint Exhibit 2a. In Section 3-400 of the August 24, 1973 Final Pretrial Order in Phase I (Docket #353), the parties adopted its contents as admitted facts in this case, and the Court adopted them as findings of fact in Finding of Fact 164 of Final Decision #1 (Docket #414). The contents of Part I and Part II through 2.2.5.3 of Joint Exhibit 2a are hereby incorporated by reference as admitted facts in this Subproceeding.

3.2 For purposes of this case, the terms “anadromous salmonids” or “salmon” refer to the following species: *Oncorhynchus kisutch* (Coho); *Oncorhynchus tshawytscha* (Chinook); *Oncorhynchus gorbuscha* (Pink); *Oncorhynchus nerka* (sockeye); *Oncorhynchus keta* (Chum); and *Oncorhynchus mykiss* (formerly *Salmo gairdnerii*) (steelhead).

3.3 Salmon spawn in freshwater, migrate to the sea, and return to spawn again in fresh water. When juvenile salmon move from freshwater to salt, they are known as smolts.

3.4 Transport and storage of wood, large woody debris, and sediment in fish bearing streams are important components of healthy productive salmon habitat.

3.5 Juvenile salmon move both upstream and downstream in response to habitat changes, predation, and population pressures.

¹Docket numbers in this section refer to the main case, C70-9213.

MODERN TRIBAL HARVESTS

3.6 In 1974 this Court found: “Subsequent to the execution of the treaties and in reliance thereon, the members of the Plaintiff tribes have continued to fish for subsistence, sport and commercial purposes at their usual and accustomed places. Such fishing provided and still provides an important part of their livelihood, subsistence and cultural identity.” *United States v. Washington*, 384 F. Supp. 312 (W.D. Wash. 1974), Finding of Fact 31.

3.7 In 1974 this Court found: “Fish continue to provide a vital component of many Indians' diet. For others it may remain an important food in a symbolic sense---analogous to Thanksgiving turkey. Few habits are stronger than dietary habits and their persistence is usually a matter of emotional preference rather than a nutritional need. For some Indians, fishing is also economically important. Fishing is also important for some non-Indians.” *United States v. Washington*, 384 F. Supp. 312 (W.D. Wash. 1974), Finding of Fact 29.

3.8 The magnitude of modern tribal salmon harvest has fluctuated as a result of many factors, some of which are human-caused and some of which are naturally occurring.

3.9 As a result of widespread alterations of waterways and sharply diminished salmon populations, the areas available for tribal harvest of salmon have decreased significantly since 1855.

3.10 Since Treaty time, overharvest, habitat alteration, poor hatchery practices, and hydropower development are some of the human-caused factors that have greatly reduced the abundance of salmon available for tribal harvest in the Case Area.

3.11 As described in Findings of Fact 33, 56, 70, and 193 in Final Decision, #1, the number of tribal members engaged in the harvest of fish declined for several decades before 1974 due to employment acculturation, the crowding out of Indians from their traditional fishing places by non-Indians, and many years of state enforcement actions against Indians exercising their claimed treaty rights, among other reasons.

3.12 As stipulated by the parties in Stipulation Re: Treaty and Non-Treaty Harvest Data (Docket # 19363/577), Tribal harvest of salmon in the Case Area from 1974 through 2007, as recorded in the treaty ticket fish database maintained by the Northwest Indian Fisheries Commission, is shown

1 below and in Exhibit AT-003-16 (chart attached as Attachment A to Order).

2 3.13 Tribal members in modern times and to the present have continued to harvest salmon
3 despite increased production costs, restricted fishing areas, fewer and shorter open seasons, fluctuating
4 market prices, competition from farm raised salmon, other human and nonhuman stresses on harvest,
5 and the availability of other economic opportunities.

6 3.14 Many members of the Tribes would engage in more commercial and subsistence salmon
7 fisheries if more fish were available.

8 3.15 Some Tribes are engaged in fisheries enhancement for the purpose of providing additional
9 fishing opportunities for tribal members, but those efforts are inadequate to meet tribal needs for salmon.

10 3.16 No plaintiff Tribe has abandoned its fisheries.

11 3.17 “Escapement” refers to adult salmon that escape harvest and other mortality and return to
12 the spawning grounds.

13 3.18 Salmon of the same species, originating in the same area and returning to spawn at the
14 same time of year, are referred to as a “stock.”

15 3.19 The State and the Tribes regulate their respective fisheries to restrict the amount of harvest
16 that might otherwise occur by limiting the number of vessels, the type of harvest gear, and the times and
17 places during which fishing may occur.

18 3.20 State and tribal fisheries co-managers plan salmon fisheries each year based, among other
19 things, on the predicted abundance of harvestable salmon within the Case Area, the need for adequate
20 escapement to replenish the population, and the predicted effects of harvest on particular stocks.
21 Because some salmon stocks that spawn in the Case Area are intercepted in fisheries up and down the
22 west coast of North America, and because some fisheries in the Case Area intercept stocks that spawn in
23 Canada or the Columbia River Basin, the process of planning state and tribal fisheries occurs as part of a
24 broader planning context that involves the governments of Canada, the United States, Alaska, Oregon,
25 California, Idaho, and Indian Tribes that are not parties to *United States v. Washington*.

26 3.21 Some State and tribal fisheries within the Case Area harvest stocks that originate both
27 within and outside the Case Area, and are planned to provide adequate escapement of stocks originating

1 both within and outside the Case Area. Some salmon fisheries in northern Puget Sound and the Strait of
2 Juan de Fuca target stocks from the Fraser River in Canada. Harvest levels of Canadian stocks are set
3 through negotiations with Canada under the Pacific Salmon Treaty.

4 3.22 Mixed stock fisheries are those in which salmon of more than one stock are present.

5 3.23 Mixed stock fisheries that target one stock may incidentally harvest other stocks.

6 3.24 Salmon stocks of more and less abundance often are found together throughout the Case
7 Area. To protect stocks that are weak or low in abundance, State and Tribal fisheries co-managers often
8 limit the harvest of stronger stocks in mixed stock fisheries to levels below those which the stronger
9 stocks could sustain. The impact of this management strategy on harvest can be two-fold: first,
10 additional harvest of stronger stocks can be limited in a mixed stock fishery; and second, a fishery can
11 be moved to “terminal areas” where weaker stocks are not mixed with stronger stocks. Because Tribal
12 treaty fishers can harvest only in their usual and accustomed grounds and stations (“U&A”), the mixed
13 stock management strategy of limiting harvest of abundant stocks to protect less abundant stocks can
14 affect the harvest by a treaty tribe with U&A in the mixed stock fishing area but without U&A in the
15 terminal area where the harvest has been moved.

16 3.25 As stipulated by the parties in the Stipulation Re: Treaty and Non-Treaty Harvest Data
17 (Docket #19363/577), for purposes of this Subproceeding only, the following table (attached to this
18 Order as Attachment A) depicts treaty tribal catch of sockeye presumed to be of Canadian origin. Treaty
19 catch of US origin versus Canadian origin sockeye stocks in Puget Sound was determined by applying
20 an assumed percentage to total catch for each year. For Canadian origin stocks, the assumed percentage
21 was determined by totaling the treaty sockeye landings in pre-terminal areas (Salmon Catch Reporting
22 Areas 4B, 5, 6, 6C, 7, 7A and 9) and dividing by the total. The Salmon Catch Reporting Areas are
23 depicted in Exhibits AT-008-2 and AT-008-3.

24 **STOCK STATUS**

25 3.26 Salmon populations in the Case Area at Treaty time were robust and had not suffered any
26 appreciable human-caused decline.

27 3.27 There have been declines in the populations of salmon originating within the Case Area

1 since Treaty time.

2 3.28 Today, while some salmon stocks in the Case Area are healthy, others are depressed, in
3 danger of extinction, or already extinct.

4 **CULVERT OPERATION AND EFFECTS**

5 3.29 Culverts are structures used to pass roads over streams and streams under roads.

6 3.30 Whether a culvert poses a velocity barrier to fish depends, in part, on the swimming
7 strength of the fish in terms of both speed and endurance.

8 3.31 Different species of salmon have different swimming strengths.

9 3.32 Juvenile salmon have less swimming strength than adult salmon of the same species.

10 3.33 Larger culverts have lower headwater at a given flow than smaller culverts and pass debris
11 and sediment better than smaller culverts and therefore reduce the risk of structural failure of culverts at
12 road crossings. Washington law currently requires that culverts shall be installed according to an
13 approved design to maintain structural integrity to the 100-year peak flow with consideration of the
14 debris loading likely to be encountered.

15 3.34 Among other factors, a partial fish passage barrier may delay migration and block the
16 passage of smaller salmon.

17 **CULVERT CORRECTION AND DESIGNS**

18 3.35 Various options are available to prevent or remedy the existence of fish passage barrier
19 culverts at stream-road intersections. These options include bridges, different types of culvert design
20 methods, and relocation of roads to avoid the stream.

21 3.36 Scientists employed by state, federal and tribal agencies continue to conduct research on
22 fish passage through culverts.

23 3.37 The current state of scientific knowledge supports the proposition that culverts which most
24 closely simulate the characteristics of the natural stream channel and substrate are the least likely to
25 inhibit fish passage.

26 3.38 During the 1990s, the Washington Department of Fish and Wildlife began developing a
27 new method for designing culverts called the "stream simulation" method. That method is described in

1 Exhibit AT-121 (W-089-B), *Design of Road Culverts for Fish Passage* (WDFW, 2003). Other entities,
2 including the U.S. Forest Service, have developed and use similar “stream simulation” culvert design
3 methodologies. *See* Stream Simulation: An Ecological Approach to Providing Passage for Aquatic
4 Organisms at Road-Stream Crossings, May 2008 (AT-119). “Stream simulation” culverts are designed
5 to create or maintain natural stream processes within the culvert. To accomplish that objective, all
6 stream simulation designs dictate that a culvert should be at least as wide as bank-full width plus a
7 buffer. Each agency calculates the width of the buffer slightly differently but the required culvert size is
8 not significantly different.

9 3.39 No state, federal or tribal manual or regulation requires the use of stream simulation in the
10 design, construction, or maintenance of culverts, although many agencies prefer the use of stream
11 simulation culverts in anadromous fish bearing streams.

12 3.40 The Washington Department of Fish and Wildlife (“WDFW”), along with federal agencies
13 such as National Marine Fisheries Service (“NMFS”) and United States Forest Service (“USFS”),
14 currently recommends use of the stream simulation method, and the State uses it in some culvert
15 replacement projects.

16 3.41 At this time, the stream simulation method of culvert design as described in *Design of*
17 *Road Culverts for Fish Passage* (WDFW, 2003) (Exhibits AT-121 and W-089-B), as well as the version
18 developed by the U.S. Forest Service, *see* Stream Simulation: An Ecological Approach to Providing
19 Passage for Aquatic Organisms at Road-Stream Crossings, May 2008 (AT-119), represents the best
20 science currently available for designing culverts that provide fish passage and allow fluvial processes.

21 3.42 In most places, the stream simulation culvert design method provides effective transport of
22 sediment.

23 3.43 Culverts designed to result in predetermined water velocities or depths at predetermined
24 flows are known as “hydraulically designed” culverts.

25 3.44 The hydraulic design criteria in Table 1 of WAC 220-110-070(3) (Exhibit W-089-F)
26 include criteria intended to permit passage by a 6-inch adult trout.

27 3.45 The State uses the adult trout criteria from Table 1 of WAC 220-110-070(3) (Exhibit W-

089-F) when designing hydraulically designed culverts for juvenile salmon passage.

3.46 The hydraulic design criteria in the adult trout portion of Table 1 of WAC 220-110-070(3) establish a maximum permissible change in water surface elevation at or above the culvert outlet of 0.8 foot.

3.47 For culverts built in fish-bearing waters, WDFW regulations at WAC 220-110-070(3) (Exhibit W-089-F) also permit culverts in small streams using a “no-slope” design method in which the culvert is placed on a flat gradient and is partially buried in the streambed. The WDFW no-slope design method for fish passage is accepted by the National Marine Fisheries Service under the Endangered Species Act for use only in very small streams where the natural slope is less than 3 percent and the culvert length is less than 80 feet, among other limitations. The Tribes have been involved in at least one barrier correction involving the no-slope design.

STATE CULVERTS

3.48 Washington State law has long required that obstructions across or in streams be provided with a durable and efficient fishway, maintained in an effective condition and continuously supplied with sufficient water to freely pass fish.

3.49 As early as 1881, Washington residents recognized the need to preserve fish access to habitat and passed laws to prohibit the construction of human-made barriers.

3.50 In 1949, the Washington Department of Fisheries issued a publication noting that salmon spawning areas are constricted by major obstructions such as dams and minor obstructions such as barrier culverts. In 1950, the Attorney General of Washington published an Attorney General’s Opinion, AGO 1950 No. 304, stating that highway culverts are subject to the Washington State law requiring fish passage at stream obstructions.

3.51 The principal State road- and land-managing agencies, and consequently the principal agencies responsible for state-owned stream crossing culverts, are Washington State Department of Transportation (“WSDOT”), Washington Department of Natural Resources (“WDNR”), WDFW and State Parks. WSDOT is not the principal land-owning agency in the Case Area.

3.52 The WSDOT is the State agency responsible for constructing and maintaining State

1 Highways so that, when the highways cross fish bearing streams, fish passage is not obstructed.

2 3.53 The WDNR manages State trust lands within the Case Area and it manages an extensive
3 network of roads on those lands, many of which cross streams bearing salmon.

4 3.54 The WDFW owns or manages Wildlife Areas and other lands in the Case Area that contain
5 roads that cross streams bearing salmon. Some of the streams are routed through culverts under these
6 roads.

7 3.55 In the early 1990's WSDOT commenced a project with the WDFW to identify barrier
8 culverts under State highways.

9 3.56 In 1997 the State initiated efforts to identify and correct barrier culverts on lands owned
10 or managed by WDFW.

11 3.57 In 1998 the State initiated efforts to identify and correct barrier culverts owned by the
12 WDNR and located on its forest lands.

13 3.58 The State began an effort to identify barrier culverts on State Parks' lands in 2001.

14 3.59 State Parks hired WDFW to identify barrier culverts on its lands within the Case Area,
15 but the contract has expired.

16 3.60 WDNR differed from the other state agencies (WDFW, WSDOT, and State Parks) in
17 the way it assessed fish bearing streams.

18 3.61 The WDFW maintains a database called the Fish Passage and Diversion Screening
19 Inventory database (FPDSI) that contains data from culvert inventories that WDFW has
20 conducted or that other governmental and private entities have submitted to WDFW. The
21 WDNR maintains a separate database for its culverts. The State has not generated a
22 consolidated list of barrier culverts owned by the different State agencies.

23 3.62 Because the FPDSI is a live database that is regularly edited and updated, inventory
24 numbers relate only for a specified date. Inventory numbers also depend on distinguishing between
25 numbers of barriers, which may include structures other than culverts; numbers of sites, which may
26 include more than one culvert; and between sites that affect "fish," "anadromous fish," which include
27 bull trout, sea run cutthroat trout, and kokanee or just "salmon."

1 3.63 As of March 2009, the WDFW culvert database showed 1215 anadromous and resident
2 fish passage barrier culverts under WSDOT roads in the Case Area. Of these, 807 barriers had more
3 than 200 meters of anadromous salmonid habitat upstream. Included within the 807 barrier
4 culverts are some 20-30 sites that are barriers only to bull trout, sea run cutthroat trout, or
5 kokanee.

6 3.64 In December 2000, WDNR completed its formal inventory efforts to identify barrier
7 culverts at stream crossings on its forest roads statewide within lands that it owned as of that
8 year. Since that date, WDNR has not conducted a formal culvert inventory.

9 3.65 The initial WDNR barrier culvert inventory, completed in 2001, identified potential
10 barrier culvert sites using road maps and stream location maps that contain inaccuracies and
11 omissions of both streams and roads.

12 3.66 Because of assumptions made during the WDNR inventory process, WDNR's barrier
13 culvert inventory included some culverts on streams that do not have fish, and excluded some
14 blocking culverts where salmon are present. WDNR, Plaintiff Tribes and others have
15 identified additional fish-bearing streams on WDNR lands, and additional barrier culverts
16 under WDNR roads, which were not identified during WDNR's formal inventory.

17 3.67 As part of its program to consolidate its upland holdings in the state, WDNR sells,
18 purchases or exchanges forestlands on a monthly basis. When WDNR adds to, reduces, or
19 exchanges its upland holdings, it affects both the number of roads and culverts beneath those
20 roads. These additional culverts undergo a preliminary assessment for fish passage during the
21 exchange appraisal process and are included in WDNR's inventory once the purchase or
22 exchange is finalized.

23 3.68 Following the completion of WDNR's culvert inventory in 2001 and taking into
24 account adjustments to the inventory, WDNR identified 860 culverts within the Case Area to
25 remediate because they were barriers to either resident or anadromous fish. As of April 2009,
26 the WDNR culvert database showed 455 remaining culverts that are barriers to either resident
27 or anadromous fish under roads it manages on lands within the Case Area. As of April 2009,

1 WDNR has identified 228 culverts within the Case Area which are anadromous barriers.

2 3.69 In 2007, WDFW completed its efforts to identify barrier culverts at stream-road
3 crossings on lands it owns or manages in the Case Area except for some water access sites and
4 lands WDFW acquired within the past 2 years. Because its initial inventory has not been fully
5 completed statewide, WDFW has not yet developed a plan for reassessing WDFW-owned
6 culverts that WDFW has previously determined to be passable.

7 3.70 As of March 2009, the WDFW culvert database showed 89 fish passage barrier culverts
8 on State Parks lands within the Case Area, of which 28 have at least 200 meters of salmon
9 habitat both upstream and downstream. State Parks has corrected one of its barrier culverts in
10 the Case Area.

11 3.71 As of July 2009, WDFW had identified 71 fish passage barrier culverts under roads on
12 its lands in the Case Area, of which 51 have at least 200 meters of salmon habitat both
13 upstream and downstream.

14 **CULVERT INVENTORY, ASSESSMENT, AND PRIORITIZATION**

15 3.72 Before 1998, to determine whether a culvert passed fish, the State relied upon the
16 professional judgment of biologists and engineers. In the 1990s, the WDFW published a
17 standardized methodology for assessing culverts for fish passage. The most recent version is
18 entitled *Fish Passage Barrier and Surface Water Diversion Screening Assessment and*
19 *Prioritization Manual* (WDFW 2000) (Exhibits AT-051 and W-087-E) (hereinafter referred to
20 as WDFW's *Assessment Manual* (2000)). Some Tribes and federal agencies have used the
21 WDFW methodology to assess culverts for fish passage.

22 3.73 Since 1998, to determine whether a culvert meets the maximum velocity and other
23 requirements of WAC 220-110-070 (3)(b)(ii) (Exhibit W-089-F), WDFW has relied on
24 evaluation of physical characteristics of the culvert. WDFW refers to this as a "Level A"
25 barrier assessment. This assessment is described in WDFW's *Assessment Manual* (2000)
26 (Exhibits AT-051 and W-087-E).

27 3.74 In some cases, WDFW considers physical characteristics of the culvert insufficient by

1 themselves to assess barrier status. In such cases it assesses the potential barrier using
2 hydraulic calculations, known as a “Level B” analysis. This assessment is described in
3 WDFW’s *Assessment Manual* (2000) (Exhibits AT-051 and W-087-E).

4 3.75 Level B barrier assessment requires a determination of the area of drainage basin
5 upstream of the culvert. Level B assessment is difficult or impossible in many cases,
6 particularly for sites within floodplains or tidal streams or having multiple parallel culverts, or
7 culverts set at an unusual gradient.

8 3.76 Because streams are dynamic in nature, periodic re-assessment or monitoring of
9 culverts is necessary.

10 3.77 WDFW uses the hydraulic criteria for adult trout in Table 1 of WAC 220-110-070(3)
11 (Exhibit W-089-F) to determine whether or not a culvert is a barrier to juvenile salmon.

12 3.78 The WDFW developed the Priority Index methodology as a tool for organizing
13 information, to help decision-makers prioritize culverts for correction. It is not law. Although
14 the State calculates Priority Index values for many of its barrier culverts, those values do not
15 control the order in which culverts are repaired and do not represent a “priority list.” Other
16 factors may cause a culvert with a lower PI score to be corrected before a culvert with a higher
17 PI score.

18 3.79 In its initial inventory completed in 2001, WDNR determined Priority Index values
19 (“PI values”) for barrier culverts. WDNR has not updated those values subsequently, nor has it
20 determined PI values for barrier culverts that were not identified in the initial inventory.

21 3.80 Each of WDNR’s regions has its own protocols that it follows to reassess habitat.

22 3.81 Because of the time and expense associated with determining habitat gain in the field,
23 WDNR has used a GIS-based process to calculate the habitat gain. Since 2001, WDNR
24 regions have used the RMAP process and their own prioritization methods to determine when
25 barriers will be removed.

26 3.82 WDNR does not have direct knowledge of all of the culverts located upstream or
27 downstream of its culverts.

1 3.83 The relative location (upstream or downstream) of barrier culverts in relation to one
2 another is not uniformly maintained in the State's Fish Passage and Diversion Screening
3 Inventory (FPDSI) database.

4 3.84 The WDFW, under a contract with WSDOT, has been assessing the extent and
5 condition of habitat above and below WSDOT barrier culverts in order to help prioritize
6 corrections.

7 3.85 As of October, 2009, the WDFW estimated that it will complete its habitat assessments
8 and prioritization for all WSDOT barrier culverts in the Case Area by January 2013, assuming
9 present staffing levels. Priority Index values have not been calculated for every fish barrier. In
10 the absence of complete habitat assessment information, it is possible to create a Surrogate PI
11 (SPI) using Geographic Information Systems (GIS) data. WDFW sometimes uses surrogate
12 PIs to decide where to focus habitat assessment efforts before identifying projects for scoping.

13 3.86 Fishery scientists use marine survival rates to annually estimate how many Coho
14 salmon smolts will survive to enter fisheries as adults. These annual estimates of adult
15 abundance, by stock, are compared to the average stock abundance during the FRAM Coho
16 Base Period and that proportion is used in annual pre-season modeling – designated as a stock
17 specific “Abundance Scalar”. These stock scalars vary from year to year as they reflect both
18 the environmental conditions that produced the out-migrating smolts (freshwater survival) and
19 the resulting adults (marine survival).

20 **STATE CULVERT CORRECTION PROGRAMS**

21 3.87 In 1990, WDFW and WSDOT executed a Memorandum of Understanding Concerning
22 Compliance With the Hydraulic Code (Exhibits AT-153 and W-087-B). Among other things,
23 the agencies agreed to conduct an inventory of fish passage barriers on WSDOT rights-of-way.

24 3.88 In 1997, the Washington State legislature created the Fish Passage Task Force.

25 3.89 In December 1997, the Fish Passage Task Force reported to the State legislature that
26 fish passage barrier culverts are a “key factor” in the wild salmon equation. It concluded that
27 “Clearly, the creation of new barriers must be prevented and the rate of barrier correction must

1 be accelerated if Washington wild salmon and trout stocks are to recover.” Since 1997, the
2 state agencies have identified fish passage barriers under their roads and have accelerated the
3 rate of correction of such barriers.

4 3.90 The WDFW and State Parks each have asserted a goal of correcting their barrier
5 culverts by July 2016.

6 3.91 The State currently has set no deadline for the WSDOT to correct all of its barrier
7 culverts.

8 3.92 The primary factor determining the rate at which the State can correct fish barrier
9 culverts is the level of funding for such corrections.

10 3.93 The WDFW determines that a barrier culvert is “corrected” when it has been removed,
11 replaced or modified in such a way as to meet the hydraulic design criteria of WAC 220-110-070(3)
12 (Exhibit W-089-F).

13 3.94 According to the WDFW *Assessment Manual* (Exhibits AT-051 and W-087-E), “A
14 significant reach is defined as a section of stream having at least 200 linear meters of useable
15 habitat without a gradient or natural point barrier. . . . An exception to the significant reach
16 threshold may occur if high quality . . . habitat exists upstream of the barrier in anadromous
17 waters.”

18 3.95 WSDOT-owned culverts that are fish passage barriers are largely remediated through
19 two different funding structures. First, fish barriers can be remediated as part of a capital
20 construction project when the barriers fall within the boundaries of a highway construction
21 project. This funding comes from the capital part of the Transportation budget. Second, fish
22 passage barriers can be addressed with funding from the WSDOT I-4 (aka, Environmental
23 Retrofit) budget.

24 3.96 WSDOT and WDFW have agreed pursuant to a Memorandum of Agreement (W-093-
25 G) that barrier culverts shall be corrected as part of a highway project when in-stream work at
26 the site of the culvert requires that WSDOT obtain a Hydraulic Project Approval (“HPA”).

27 3.97 The Washington State Salmon Recovery Funding Board has no record of WSDOT ever

1 receiving grant award funds towards a culvert or fish passage project.

2 3.98 WDFW has received grants for culvert inventory work, but as of January 2009, not for
3 culvert correction or monitoring.

4 3.99 About 20% of WDNR's barrier remediation projects have been accomplished by
5 requiring timber purchasers to correct culverts as part of a timber sale contract. WDNR pays
6 for corrections to its barrier culverts not remediated by timber purchasers principally through
7 fees on timber sales that are credited to the Access Road Revolving Fund ("ARRF Fund").

8 The ARRF Fund is a non-appropriated account managed by the WDNR to maintain, repair,
9 and reconstruct access roads, or public roads used to provide access to public lands. RCW
10 79.38.050. WDNR also uses grant funds and FEMA funds to correct small numbers of
11 culverts.

12 3.100 For the biennia covering the period from 2007-11, WDNR did not request any
13 appropriations of general funds from the State legislature for correction of barrier culverts on
14 state-owned trust lands. WDNR requested such funds in its proposed budget for the 2005-
15 2007 biennium and in prior biennia for other road maintenance work, but the requested funds
16 were not appropriated by the legislature. WDNR requested and received general fund monies
17 for seven barrier culvert remediation projects on non-trust lands dedicated to conservation
18 (called Natural Area Preserves and Natural Resource Conservation Areas).

19 3.101 The funding available from the ARRF Fund for culvert corrections, and the number
20 corrected as part of timber sales, depend in part on the volume and price of timber sold and
21 harvested from WDNR lands.

22 3.102 Before 2001, WDNR had no deadline for correcting its fish passage barrier culverts.

23 3.103 Prior to 2006, the WDNR did not have sufficient funding to correct all of its barrier
24 culverts by July 2016.

25 3.104 WDNR believes it will be able to correct its anadromous barrier culverts within the
26 Case Area prior to July 2016, which is the deadline set by State law.

27 3.105 State agencies request separate appropriations for their operating and capital budgets.

28 MEMORANDUM AND DECISION - 16

1 The budget requests for WDFW, WDNR and State Parks are made as part of the general
2 budget and WSDOT's budget requests are included in a separate transportation budget. Funds
3 for culvert work on lands or roads an agency manages may fall within its capital budget or its
4 operating budget, or the transportation budget.

5 3.106 As of January 2009, WDFW reports that it has expended approximately \$2,000,000 to
6 fix state-owned barriers in the Case Area since 1999. WDFW includes dams, fishways as well
7 as culverts in "state owned barriers." Also included within the \$2,000,000 was some post-construction
8 monitoring.

9 3.107 WDFW has prepared a 10-year project planning document for correcting by July 2016
10 its statewide fish passage barriers.

11 3.108 The WDNR has determined the average cost of remediating its barrier culverts as
12 follows:

13 a) no slope design method: \$41,000

14 b) stream simulation design method: \$54,000

15 c) bridge: \$123,000.

16 The average of all three types of structures is approximately \$81,000. However, none of those
17 figures includes costs for the engineering related to the design of the replacement structure,
18 which are typically around 10% of the total project cost. WDNR estimates the average cost to
19 remove a culvert from a forest road that is being abandoned is \$13,000.

20 3.109 WDFW estimates that the average cost to correct its fish passage barriers is \$230,000 in
21 2008 dollars.

22 3.110 In the transportation budget, the State legislature may re-appropriate funds not
23 expended by the end of the biennium. Such re-appropriations are made at the subprogram
24 level and are not project specific.

25 3.111 WSDOT has tracked the costs of performing stand-alone barrier correction projects
26 through its I-4 Environmental Retrofit program. WSDOT has not been able to track the costs
27 of corrections undertaken as part of a larger highway improvement project because the barrier

1 replacement costs are not easily segregated from the cost of the rest of the project. For
2 example, documentation of the costs of cement is typically for the entire project, without an
3 easy way to extract how much was exclusively used for the culvert construction.

4 3.112 The funding source (federal versus state), the bidding environment, and labor laws can
5 all affect the cost of the project.

6 3.113 The Washington State Legislature could designate specific additional revenue sources
7 for fish passage barrier remediation in a manner similar to the current “Nickel” (5 cent per
8 gallon special gasoline tax) or Transportation Partnership Act (“TPA”) (9.5 cent per gallon
9 special gas tax) programs either as additional programs or when the current Nickel and TPA
10 programs expire.

11 3.114 The State Legislature could reprioritize some portions of the Transportation Budget to
12 increase funding for fish passage barrier remediation, but only at the expense of other projects
13 and responsibilities.

14 3.115 Current bidding on WSDOT construction projects is typically running 15 to 20 per cent
15 lower than the WSDOT engineers’ pre-bid estimates of project costs.

16 3.116 WSDOT highway construction projects are categorized as either improvement or
17 preservation programs within the state transportation budget. WSDOT improvement projects
18 are aimed at correcting specific deficiencies within the transportation system or network.
19 WSDOT’s improvement program consists of both safety and mobility projects. WSDOT
20 preservation projects are aimed at preserving at-risk roads and bridges.

21 3.117 In addition to the fish passage retrofit barrier program, both the chronic environmental
22 deficiencies (CED) program and the stormwater retrofit program provide benefits to fish
23 survival. Chronic environmental deficiencies are locations along the state highway system
24 where recent, frequent, and chronic maintenance needs are causing impacts to fish and fish
25 habitat. An example of a CED is erosion of a road prism from a stream close to a state highway.

26 3.118 WSDOT mobility projects typically consider barrier corrections when known and when
27 HPAs are required. Since 1991, WSDOT has completed 143 fish passage projects statewide in

1 the course of Transportation projects, of which 32 require additional work to meet current
2 passage criteria.

3 3.119 Culverts owned by WDNR, WDFW and State Parks are generally found underneath
4 narrow unpaved roads which carry a smaller amount of traffic compared to the average state
5 highway. For these reasons, the cost of correcting these culverts is less than the cost of
6 correcting culverts under state highways.

7 3.120 The budget for WSDOT is largely funded from the 37.5 cents per gallon gas tax. The
8 projected revenue from the gas tax for the 2009-2011 biennium based on the March 2009 forecast is
9 \$2.653 billion. This tax is directed into the Motor Vehicle Fund for disbursement. An
10 additional \$373 million is projected to be collected from licenses, permits, and fees that is
11 available to be paid into the Motor Vehicle Fund.

12 3.121 The net disbursement of the 37.5 cents per gallon tax is as follows: 9.5 cents is
13 dedicated to projects specified in the Transportation Partnership Act ("TPA") that was enacted
14 in 2005. The 9.5 cent TPA tax was enacted with restrictions that the revenue raised by the tax
15 can only be spent on projects that have been specified and approved by the legislature.
16 Another 5 cents of the gas tax is dedicated to the projects specified by the Legislature when the
17 Nickel tax was passed. The Nickel tax is scheduled to sunset when the projects specified by
18 the Legislature have been completed and the bond debt has been retired. The cities and
19 counties receive 11 cents from the gas tax revenue. Another 4 cents of the gas tax revenue is
20 dedicated to paying bond debt.

21 **MONITORING AND MAINTENANCE**

22 3.122 Culverts have a hydraulic design life of 30 to 80 years, depending on their material and
23 other factors.

24 3.123 All culverts will require some level of maintenance during their useful life to ensure
25 hydraulic function.

26 3.124 The parties are unaware of any studies that have estimated or determined the rate at
27 which currently passable culverts may become fish passage barriers in the future or identified

1 methods for estimating or determining such rates.

2 3.125 Culverts that are not fish passage barriers when installed may become barriers over
3 time due to erosion, hydrologic changes, and other natural processes.

4 3.126 WDFW monitors WSDOT barrier culvert correction projects built with dedicated
5 funding for one year after construction. WDFW conducts spawner surveys on some culverts
6 that have been corrected to verify that adult salmon are getting through the new structure and
7 spawning upstream of it. Projects that failed to meet fish passage criteria are listed as barriers
8 in the Fish Passage and Diversion Screening Inventory database and/or scoped and
9 programmed for correction along with other barriers.

10 3.127 The Forest Practices Rules require WDNR to maintain fish passage in its culverts.
11 After major storm events, WDNR visually inspects large culverts for damage.

12 3.128 Fishways are formal structures that include specific features to optimize fish-passage
13 conditions, providing maximum vertical gain over a given distance. Fishways applied at
14 culverts typically consist of a series of pools separated by weirs that control the elevation
15 differential between pools.

16 3.129 Fishways require regular inspection and maintenance.

17 3.130 WSDOT contracts with WDFW to inspect its fishways.

18 **SALMON RECOVERY EFFORTS**

19 3.131 The WDFW has recognized that culverts must be corrected in order to accomplish the
20 State's salmon recovery efforts and to comply with several laws including fish passage laws
21 and the new Forest Practices Rules.

22 3.132 The State Salmon Recovery Funding Board has worked with Indian Tribes and others
23 to correct fish passage barrier culverts with the result that habitat previously inaccessible to
24 fish has become accessible. Since 1999, the SRF Board has awarded funds for salmon habitat
25 restoration projects, such as placement of large woody debris, planting of riparian vegetation,
26 and removal of fish passage barrier culverts. The primary sources of SRF Board funding are
27 the Washington State Legislature and the federal Pacific Coastal Salmon Recovery Fund.

1 3.133 None of the recovery plans identified in the Statewide Strategy to Recover Salmon, *i.e.*,
2 recovery plans for Puget Sound Chinook; Hood Canal Summer Chum; Lower Columbia Chum; Lower
3 Columbia Steelhead; Lower Columbia Chinook; Lower Columbia Coho; Middle Columbia Steelhead;
4 Upper Columbia Steelhead; Upper Columbia Chinook; Snake River Spring Chinook; and Snake River
5 Steelhead, obligate any party other than the National Marine Fisheries Service and thus are neither
6 enforceable nor regulatory.

7 3.134 The federal government provides some of the funds spent by the State for correction of
8 barrier culverts and for other salmon recovery activities. Much of the grant money awarded by
9 the Salmon Recovery Funding Board comes from the Pacific Coastal Salmon Recovery Fund.
10 Tribes have been the recipients of some of these funds. Pretrial Order, Dkt. # 614, pp. 5-30.

11 **This concludes the admitted facts.** The Court further finds as follows:

12 4. At the time of trial in 2009, WDFW had identified 807 WSDOT barrier culverts which
13 blocked more than 200 meters of salmon habitat upstream of the culvert. Admitted Fact 3.63.
14 Fisheries scientists have identified approximately 1,000 miles of stream, comprising nearly 4.8 million
15 square meters of stream habitat upstream of blocked culverts. State Exhibit AT-323. This habitat is
16 unavailable to salmon moving upstream to spawn.

17 5. The correction of human-caused barriers is recognized as the highest priority for restoring
18 salmon habitat in the Case Area. Declaration of Mike Henry, Ex. AT-004.

19 6. Fish, especially salmon, continue to be an important part of the Tribes' history, identity, and
20 culture.

21 7. Salmon abundance has declined precipitously from treaty times, but particularly in the last
22 few decades. Numerous salmon stocks that originate or are fished in the Case Area have been listed as
23 threatened or endangered under the Endangered Species Act ("ESA"). These stocks include Puget
24 Sound Chinook, Lower Columbia River Chinook, Ozette Lake Sockeye, Puget Sound Steelhead, and
25 Hood Canal Summer Run Chum.

26 8. Both treaty and non-treaty harvests have declined substantially since the time of the first
27 decision in *U.S. v. Washington*, 384 F. Supp. 312 (W.D.Wash. 1974) ("Boldt Decision").

1 9. The decline in abundance of salmon has greatly reduced fishing opportunities for the Tribes.
2 Tribal members have been forced to greatly limit the amount of time they fish, and the areas fished. The
3 reduced fishing opportunity has contributed to a decline in the number of tribal members who are now
4 engaged in the traditional activity of fishing.

5 10. The reduced abundance of salmon and the consequent reduction in tribal harvests has
6 damaged tribal economies, has left individual tribal members unable to earn a living by fishing, and has
7 caused cultural and social harm to the Tribes in addition to the economic harm.

8 11. Tribal members learn fishing skills from older members of the Tribe. Reduced fishing
9 opportunities interfere with the learning process for younger fishermen and women.

10 12. Reduced salmon harvests interfere with the Tribes' traditional First Salmon Ceremonies,
11 which traditionally utilize fish from local streams. Tribal members are also less able to provide salmon
12 for other ceremonies such as naming ceremonies, weddings, and other gatherings.

13 13. The Tribes are at present unable to harvest sufficient salmon to meet their needs and provide
14 a livelihood for those tribal members who desire to fish for salmon for a living.

15 14. Salmon production is directly related to the amount and quality of habitat available. Loss
16 and degradation of habitat have greatly reduced salmon production in the Case Area.

17 15. Cyclical patterns in ocean conditions and other natural disturbances cannot account for the
18 persistent, long-term downward trend in Case Area salmon populations.

19 16. Reductions in salmon harvests by tribal and non-tribal fishers, leaving more adult fish to
20 spawn, will not result in substantial increases in salmon production unless accompanied by gains in
21 habitat, particularly spawning ground.

22 17. A fish passage barrier culvert is a culvert that impedes the passage of any life stage of any
23 species of anadromous fish at any flow level which would allow the passage of fish, but for the culvert.
24 This includes all culverts identified as barrier culverts under the 2000 WDFW Barrier Assessment
25 manual.

26 18. The Washington Administrative Code ("WAC") contains rules and expresses policies
27 governing state agencies. WAC 220-110-010 under the Hydraulic Code Rules states that it is the intent

1 of WDFW to provide protection for all fish life through a statewide system of “consistent and
2 predictable rules.” The technology provisions of WAC 110 represent “common provisions for the
3 protection of fish life for typical projects proposed to the department.” *Id.* The regulations represent
4 “the best available science and practices related to protection of fish life.” *Id.*

5 19. WAC regulations applicable to the Washington Forest Practices Board provide that “[t]o
6 protect water quality and riparian habitat, roads must be constructed and maintained in a manner that
7 will prevent potential or actual damage to public resources.” WAC 222-24-010(2). This “will be
8 accomplished by constructing and maintaining roads so as not to result in the delivery of sediment and
9 surface water . . . in amounts that preclude achieving desired fish habitat and water quality” and by
10 “providing for fish passage at all life states” (referring to the WDFW Hydraulic Code). *Id.*

11 20. Fish passage barrier culverts have a negative impact on spawning success, growth and
12 survival of young salmon, upstream and downstream migration, and overall production. According to
13 “Extinction is Not an Option: Statewide Strategy to Recover Salmon” (September 1999),

14 Unnatural physical barriers interrupt adult and juvenile salmonid passage in many streams,
15 **reducing productivity and eliminating some populations.** Barriers may also cause poor
16 water quality (such as elevated temperature or low dissolved oxygen levels) and unnatural
sediment deposition. Impaired fish access is one of the more significant factors limiting
salmonid productivity in many watersheds.

17 Fish blockages or barriers are caused by dams, culverts, tide gates, dikes, and other instream
18 structures. . . . **These structures block fish access to an estimated 3,000 miles of freshwater
spawning and rearing habitat.**

19 Ex. AT-114, at II.17-18 (emphasis added).

20 21. Young salmon, which do not have the swimming power of adults, are more easily blocked
21 by barrier culverts. As a result, they may never migrate to the ocean, reach maturity, and return to
22 spawn.

23 22. The negative effect of culverts is not limited to blocking actual passage of fish and
24 preventing them from reaching spawning grounds. Improperly designed culverts may result in loss of
25 spawning and rearing habitat due to shortening and simplification of the channel, loss of pools and other
26 complex habitats, elimination of riparian vegetation, changes in litter and food sources, improper
27

1 filtration of sediment, and other adverse impacts on the stream. Testimony of Dr. Martin Fox, AT-001,
2 p. 2.

3 23. Culverts may also cause negative effects on stream quality and fish habitat by altering the
4 water velocity, which may cause sedimentation or erosion, and may ultimately result in a “perched”
5 culvert which is a barrier to upstream fish movement. Red Cabin Creek on State Route 520 provides an
6 example of a culvert filled with sediment. AT-010-8 to AT-010-12. A culvert blocked with sediment
7 may divert water into adjacent ditches and channel, causing erosion and stranding fish, leading to
8 additional mortality of adult and juvenile salmon. AT-010-13.

9 24. Culverts which are improperly designed, installed, or maintained may completely bar
10 salmon from access and cause local extirpation of a run. Testimony of Mike McHenry, AT-004, p. 4.
11 For example, Chinook salmon from Pysht River and Morse Creek on the Olympic Peninsula are locally
12 extirpated. *Id.*, p. 3.

13 25. A 1994 analysis of loss of coho salmon production in the Skagit River watershed determined
14 that 6% to 13% of the loss throughout the watershed was attributable to barrier culverts. When
15 tributaries alone were analyzed, 44% to 58% of the loss of salmon production was attributable to barrier
16 culverts. AT-010, p. 10.

17 26. Culverts which do not allow the downstream movement of woody debris and sediment have
18 a negative impact on the downstream spawning grounds and general stream habitat. Such culverts also
19 may become blocked with debris and fail during high water events, causing severe erosion and damage
20 to habitat downstream. The effect on salmon populations can be “devastating.” Testimony of Lawrence
21 Wasserman, AT-010, p. 28.

22 27. State-owned barrier culverts are so numerous and affect such a large area that they have a
23 significant total impact on salmon production. WDFW categorizes culverts as blocking “significant
24 habitat” when there is at least 200 meters of inaccessible habitat upstream of the culvert. As of the trial
25 date in 2009, there were 1,114 state-owned culverts in the Case Area, including at least 886 that blocked
26 “significant habitat,” including 807 such culverts under roads built or maintained by WSDOT, 28 under
27 the control of State parks, and 51 under the control of WDFW. WDFW records showed at that time that

1 State-owned barrier culverts blocked salmon access to an estimated 1,000 miles of stream and nearly
2 five million square meters of habitat. Admitted Facts 3.64 - 3.71. A WSDOT spreadsheet inventory of
3 the culverts and the amount of spawning and rearing habitat blocked by each appears in the record at
4 AT-323.

5 28. In the year of the trial and two following years, 2009 - 2011, WSDOT completed twenty-
6 four barrier culvert replacement projects. Tribes' Post-Trial Supplemental Brief, Dkt. # 751, p.5;
7 Declaration of Alix Foster, Dkt. # 749, Exhibit A, pp. 8-15.² Tables 5 and 7 in the WSDOT *Fish*
8 *Passage Barrier Inventory: Progress Performance Report* (July 2012) ("2012 Barrier Inventory")
9 provide these figures for Regions 1, 2, and 3 (Northwest, North Central, and Olympic Regions).
10 (Twenty-five projects are listed for the years 2009 - 2011, but one, at Wagley's Creek, is a dam removal
11 rather than replacement of a culvert.) At this rate of eight projects per year, assuming no new barrier
12 culverts were to develop, it would take the State more than 100 years to replace the "significantly
13 blocking" WSDOT barrier culverts that existed in 2009.

14 29. Estimates based on an assumption of no new barrier culverts are unsound, as new barrier
15 culverts have in fact been identified since 2009. WSDOT reported 1,158 fish passage barrier culverts in
16 the Northwest and Olympic Regions in 2009. See, WSDOT *Fish Passage Barrier Inventory: Progress*
17 *Performance Report* (July 2009) ("2009 Barrier Inventory"), AT-072, p. 7. The 2012 WSDOT report
18 lists a total of 1,236 fish passage barriers culverts in these same two regions. The number of barriers
19 with significant habitat gain in these two regions alone has **increased** from 883 to 930. Compare, Table
20 2 in the 2009 Barrier Inventory with Table 2 in the 2012 Barrier Inventory (attached as Attachment B to
21 this Memorandum and Order).

22 30. According to the Declaration of Paul Wagner filed in support of the State's supplemental
23 memorandum, WSDOT works with WDFW to reassess barrier culverts. This reassessment leads to the

24
25 ² This supplemental brief and supporting declarations were filed at the Court's direction. The
26 Court requested supplemental memoranda of the parties to address changes in the facts that may have
27 occurred since the time of trial. The Declaration of Alix Foster presents facts that appear in the WSDOT
28 *Fish Passage Inventory Progress Performance Report* (July 2012), a State document of which the Court
may take judicial notice. The document is available online at www.wsdot.wa.gov/ and a copy of this
document is attached as Attachment B to this Order.

1 statewide totals reported in the 2012 Barrier Inventory. Declaration of Paul Wagner, Dkt. # 746, ¶ 8.
2 As of the date of that report, the total number of WSDOT fish passage barriers, state-wide, was 1,988, of
3 which 1,519 were barriers with significant habitat gain. *Id.*; 2012 Barrier Inventory, Table 2. Of the
4 1,519 barriers with significant habitat gain, 817 lie within the Case Area. *Id.*, ¶ 8.

5 31. The increase in the total number of WSDOT barrier culverts has occurred despite the fact
6 that twenty-four barrier culverts in the Case Area have been corrected since 2009. Extrapolation from
7 these data would lead to the untenable conclusion that under the current State approach, the problem of
8 WSDOT barrier culverts in the Case Area will never be solved.

9 30. WDFW and DNR have achieved greater success than WSDOT in constructing remedies for
10 barrier culverts. From 2009 through 2012, WDFW remedied twenty-eight barrier culverts in the Case
11 Area, resulting in 46,415 linear meters of habitat gain upstream of these culverts. Declaration of Julie
12 Hennings, Dkt. # 744, ¶¶ 5, 9-10. This work was the result of appropriations to WDFW by the
13 legislature of \$1,000,000 for the 2009-11 biennium and \$2,731,000 in the 2011-13 biennium. *Id.*, ¶¶ 9,
14 10. An additional \$1,495,000 was appropriated in 2012 from the Jobs Now! Act to correct fish passage
15 barriers on WDFW land, of which \$810,000 was for correction of culverts within the Case Area. *Id.*, ¶
16 10.

17 31. As of January 29, 2013, there remained fourteen culverts which blocked more than 200
18 meters of salmon and steelhead habitat on WDFW lands in the Case Area, and another five culverts
19 which blocked less than 200 meters of anadromous fish habitat in the Case Area. Declaration of July
20 Hennings, Dkt. # 744, ¶ 6.

21 32. From 2009 through 2012, DNR remediated 126 barrier culverts in the Case Area.
22 Declaration of Alex Nagygyor, Dkt. # 740, ¶ 5. DNR has eighty-seven culverts which pose barriers to
23 anadromous fish remaining at this time. *Id.*

24 33. Most of the funds available to DNR for correcting barrier culverts come from the Access
25 Road Revolving Fund (“AARF”), which is derived from income from timber sales. *Id.*, ¶ 10. During
26 the 2011 to 2013 biennium, DNR also received \$5,700,000 from the State’s Capital Budget (Building
27 and Construction Account) for Road Maintenance and Repair Plan (“RMAP”) work, which includes

1 culvert repair. *Id.*, ¶ 11. DNR has received additional funds, totaling \$4,000,000 from FEMA (Federal
2 Emergency Management Agency). *Id.*, ¶ 12.

3 34. State Parks has corrected one barrier culvert since the 2009 trial. Declaration of Deborah
4 Peterson, Dkt. # 742, ¶ 7. It is estimated that twenty-three significant barrier culverts remain in the Case
5 Area on land under the control of State parks. *Id.*, ¶ 5.

6 35. The State Forest Practice Board has promulgated regulations under the Forest Practices Act
7 which provides that the goals for road maintenance and culvert replacement established in WAC 222-
8 24-010 (set forth in relevant part above in FF 19) are “expected to be achieved by October 31, 2016.”
9 WAC 222-24-050. This regulation is binding on DNR and has been adopted by WDFW and State
10 parks. *See*, Admitted Fact 3.90. The original date of July 1, 2016 has been extended to October 31,
11 2016. Declaration of Alex Nagygyor, Dkt. # 740, ¶ 15.

12 36. WDFW has stated its intention to remedy six of the remaining fourteen culverts which block
13 more than 200 meters of upstream habitat before the 2016 deadline. *Id.*, ¶ 12. WDFW represents that
14 the remaining eight culverts pose challenges such as interference with hatchery operations, or access
15 issues, which it will discuss with the Tribes. *Id.*

16 37. If DNR maintains the rate of barrier correction that it has achieved over the past three years,
17 the remaining eighty-seven barrier culverts will be corrected by the 2016 deadline. Declaration of Alex
18 Nagygyor, Dkt. # 740, ¶ 16.

19 38. Correction of fish passage barrier culverts is a cost-effective and scientifically sound method
20 of salmon habitat restoration. It provides immediate benefit in terms of salmon production, as salmon
21 rapidly re-colonize the upstream area and returning adults spawn there. Exhibit AT-004, p. 12.

22 39. Restoration of salmon runs through correction of State-owned culverts benefits both Tribal
23 and non-Tribal fisherman.

24 40. Species listed under the Endangered Species Act (Puget Sound Chinook, Hood Canal
25 summer chum salmon, and Puget Sound steelhead) are monitored by the National Marine Fisheries
26 Service (NMFS). The data and conclusions are published in periodic status reviews. Plaintiff United
27 States of America presented selected pages from the NMFS December 10, 2010 *Status Review Update*

1 *for Pacific Salmon and Steelhead Listed under the Endangered Species Act.* Declaration of Yvonne
2 Marsh, Dkt. # 736, Exhibit 1. The status report identifies risk factors for Puget Sound Chinook as “high
3 fractions of hatchery fish in many populations and widespread loss and degradation of habitat.” *Id.*, p.
4 2. Noting a recent decline in productivity of the Hood Canal summer chum salmon, the status report
5 suggests that” improvements in habitat and ecosystem function [are] needed.” *Id.*, p. 3. For Puget
6 Sound steelhead, the status report makes the alarming observation that “steelhead in the Puget Sound
7 DPS [distinct population segment] remain at risk of extinction throughout all or a significant portion of
8 their range in the foreseeable future. . .” *Id.*, p. 4. The Biological Review Team identified “degradation
9 and fragmentation of freshwater habitat, with consequent effects on connectivity, as a primary limiting
10 factor and threat facing the Puget Sound steelhead DPS.” *Id.*

11 41. NMFS is responsible for implementing Section 7 of the Endangered Species Act (ESA) for
12 actions that affect habitat of threatened or endangered species. Federally funded or permitted actions by
13 the State of Washington which affect anadromous fish, such as repair or replacement of culverts, require
14 consultation with NMFS under Section 7 and, where the action potentially effects listed species, the
15 preparation of a biological opinion. Declaration of Steven Landing, Dkt. # 737, ¶¶ 1-2. NMFS has
16 issued programmatic biological opinions that address culvert repair and replacement by the State of
17 Washington to streamline the process. If the project satisfies certain design criteria, the federal agency
18 can issue a permit or provide funding without further Section 7 consultation with NMFS. *Id.*, ¶ 3.

19 42. On December 12, 2012, NMFS issued a programmatic biological opinion for the Federal
20 Highway Administration (FHWA) and Army Corps of Engineers for the WSDOT’s Preservation,
21 Improvement, and Maintenance Activities program. This programmatic opinion covers projects
22 conducted by WSDOT, including projects within the Case Area, which are funded by the FHWA, or
23 permitted by the Corps, and include specified activities such as culvert repair and replacement. *Id.*, ¶ 5.
24 There is an even more streamlined “fast track” process for projects that involve culverts which block
25 passage of ESA-listed species. *Id.*, ¶ 6.

26 43. In order to qualify for these expedited permits, projects that replace culverts on streams with
27 listed species must apply the WDFW stream simulation or no-slope design criteria. These design

1 criteria are relied upon by NMFS to ensure fish passage. *Id.*, ¶ 7.

2 44. The State of Washington has invested a great deal of time and money in developing the Fish
3 Passage Priority Index referred to in FF 3.78. WSDOT has invested \$3,800,00 for fish passage barrier
4 inventory and prioritization since October, 2009. Declaration of Paul Wagner, Dkt. # 746, ¶ 6. In the
5 2009-2011 biennium, WSDOT and WDFW began to reassess culverts thought to have the highest
6 likelihood of becoming barriers, in order to evaluate their current status. *Id.*, ¶ 8. This reassessment led
7 to the July 2012 statewide totals listed in FF 29-30. Nowhere in this declaration does Mr. Wagner
8 connect the twenty-four culverts that were corrected by WSDOT within the Case Area in 2009 - 2011
9 (FF 28) with the assessment and prioritization process.

10 45. Only four of the twenty-four fish passage barriers corrected by WSDOT in 2009 - 2011 were
11 among the 163 culverts identified by the State for priority in correction. *See*, State of Washington Post-
12 Trial Brief, Dkt. # 663, p. 13-14; AT-323; 2012 Barrier Inventory, Tables 5 and 7.

13 46. Priority Index numbers range from 1 to 62. Declaration of Michael Barber, W-088, ¶ 12.
14 The higher the number, the higher the priority to fix the culvert. As of 2009, most (but not all) WSDOT
15 barrier culverts with a PI greater than 20, and no additional barrier culverts in the watershed, had been
16 fixed. *Id.*

17 47. PI numbers for the twenty-four WSDOT culverts which were repaired or replaced in the
18 Case Area in 2009 - 2011 ranged from 6.36 (Yarrow Creek tributary on SR 520) to 26.44 (Terrell Creek
19 culvert replacement on SR 542). 2012 Barrier Inventory, Tables 5 and 7.

20 48. The State of Washington asserted at trial that the average cost to replace a WSDOT culvert
21 would be \$2,300,000. However, the actual cost of construction for twelve WSDOT stream simulation
22 culvert projects completed prior to the 2009 trial ranged from \$413,000 to \$1,674,411; the average cost
23 for the twelve was \$658,639 each. AT-101, *Fish Passage Projects Completed with Dedicated I-4*
24 *Funds*.

25 49. WSDOT has provided with its supplemental memorandum a table titled “WSDOT Barrier
26 Correction Projects Completed since June 2010.” Declaration of Paul Wagner, Dkt. # 746, Exhibit A.
27 The table lists thirty-one barrier correction projects statewide, of which twenty-four used either the

1 stream simulation design or a bridge. Mr. Wagner states that the average cost of these twenty-four
2 WSDOT projects was \$1,827,168. *Id.*, ¶ 9. However, it is difficult to confirm this figure from the
3 tables, as eight of the stream simulation culvert projects, along with four of the “no-slope” design
4 projects, have no cost listed. It appears these twelve are the ones described by Mr. Wagner as
5 “constructed and funded as a part of other transportation projects.” *Id.*, ¶ 5. See FF 3.111.

6 50. Full-span bridges across streams, and stream simulation culverts, offer superior fish passage
7 and habitat benefits compared to hydraulic design and no-slope culverts. Stream simulation culverts are
8 less likely than hydraulic design or no-slope culverts to become fish passage barriers in the future.
9 Bridges or stream simulation culverts are the preferred WSDOT choices. Declaration of Paul Wagner,
10 Dkt. # 746, ¶ 9.

11 51. Of the fish passage barrier corrections undertaken by WSDOT since 1992, approximately
12 two-thirds have been undertaken as part of a highway maintenance or improvement project, and one
13 third have been “stand-alone” projects funded through the I-4 program.

14 52. A large portion of WSDOT’s funding comes from the United States. According to
15 documents provided with the supplemental memorandum, the State expects to receive over \$22,000,000
16 for fish passage barrier projects from the federal government in the years 2011 to 2017. Declaration of
17 Alix Foster, Dkt. # 749, Exhibit 12. Of this amount, \$15,813,000 is expected in the 2013-2015
18 biennium.

19 53. Combined with the federal funding for fish passage barrier correction, the State anticipates
20 another \$14,425,000 from the 2005 Transportation Partnership Account, for a total of \$37,387,000 for
21 fish passage barrier correction in the years 2011-2017. *Id.*

22 54. The WSDOT budget is separate from the State of Washington operating budget and capital
23 budget, as demonstrated in “A Citizen’s Guide to Washington State: 2012 Transportation Budget.”
24 Declaration of Alix Foster, Dkt. # 749, Exhibit 10. According to this state document, for the 2011-2013
25 biennium, the State of Washington budget allocates \$60.9 billion to the Operating Budget, \$9.9 billion
26 to the Transportation Budget, and \$3.7 billion to the Capital Budget. *Id.* The Operating Budget funds
27 day- to-day operations; the Capital Budget funds acquisition and maintenance of buildings and facilities,

1 including public schools and higher education facilities; and the Transportation Budget funds both
2 operations and capital expenditures for transportation, including road building, maintenance, and repair.
3 *Id.*

4 55. Of the \$9.9 billion budgeted for transportation, \$7.88 billion is allocated to WSDOT. *Id.*

5 56. The separation of the Transportation Budget from the Operating and Capital budgets ensures
6 that money will not be taken from education, social services, or other vital State functions to fund
7 culvert repairs.

8 57. The largest source of revenue for the Transportation Budget is the state gas tax, which is
9 predicted to comprise 46.4% of the revenue available to transportation services in the 2011 - 2013
10 biennium. Transportation Revenue Forecast Council: November 2012 Transportation Economic and
11 Revenue Forecasts; Declaration of Alix Foster, Dkt. # 749, Exhibit 11, Figure 2. Under the Washington
12 State Constitution, the gas tax revenue must be devoted exclusively to transportation needs, including
13 correction of barrier culverts under State highways.

14 58. Total transportation revenues are expected to rise in the years 2012 - 2016, compared to
15 2008 - 2012. *Id.*, Figure 1. The Fiscal Year 2013 increase in revenue is 5.6% over FY 2012. *Id.*
16 Continued growth is predicted at an annual rate of 1.2% per year over the next ten years. *Id.*

17 59. Much of this increased funding for transportation could be used to correct WSDOT barrier
18 culverts at a faster rate than has been maintained previously.

19 60. There is no evidence that increased funding toward correction of barrier culverts to meet the
20 State's obligations under the Stevens Treaties will compromise safety or mobility programs also funded
21 by the State's Transportation Budget.

22 CONCLUSIONS OF LAW

23
24 1. The Court has jurisdiction over the parties and the subject matter pursuant to Paragraph 25 of
25 the Permanent Injunction, as amended August 11, 1993 ("Paragraph 25"). *U.S. v. Washington*, 384
26 F.Supp. 312, 419 (W.D.Wash. 1974); C70-9213, Dk.t # 13599. Pursuant to this section, the Court has
27 continuing jurisdiction to determine "whether or not the actions, intended or effected by any party. . .

1 are in conformity with Final Decision #1 or this injunction. . . .” Paragraph 25(a)(1). The construction,
2 maintenance, repair and replacement of culverts are actions effected by the State of Washington which
3 may be evaluated for conformity with Final Decision # 1. The Court also has jurisdiction to consider
4 “[d]isputes concerning the subject matter of this case which the parties have been unable to resolve
5 among themselves,” and [s]uch other matters as the court may deem appropriate.” Paragraph 25(a)(4),
6 (7). The State and the Tribes have attempted to resolve this issue and have been unable to do so
7 without Court involvement. The Court deems it appropriate to resolve the dispute at this time.

8 2. The scope of this subproceeding includes only those culverts that block fish passage under
9 State-owned roads. Stipulation of Plaintiffs and State of Washington Regarding Scope of Sub-
10 Proceeding, Dkt. # 341, ¶ 1.

11 3. The Court is not limited in granting relief to requiring that culverts identified as blocking fish
12 passage be repaired. The Court may use its equitable powers to formulate a remedy consistent with
13 orders entered in this case. Stipulation, Dkt. # 341, ¶ 2.

14 4. This Memorandum and Decision incorporates all previous rulings in this subproceeding,
15 including but not limited to rulings on waiver and estoppel, the inapplicability of constitutional defenses
16 asserted by the State of Washington, and the declaratory judgment entered in favor of the Tribes on
17 August 23, 2007. The State of Washington’s motion for reconsideration of that ruling, set forth in the
18 post-trial memorandum, is DENIED.

19 5. The Treaties were negotiated and signed by the parties on the understanding and expectation
20 that the salmon runs were inexhaustible and that salmon would remain abundant forever. Finding of
21 Fact (“FF”) 1-2.

22 6. Salmon stocks in the Case Area have declined alarmingly since treaty times. A primary cause
23 of this decline is habitat degradation, both in breeding habitat (freshwater) and feeding habitat
24 (freshwater and marine areas).

25 7. One cause of the degradation of salmon habitat is blocked culverts, meaning culverts which
26 do not allow the free passage of both adult and juvenile salmon upstream and downstream. Culverts
27 which block the upstream passage of adult salmon returning to spawn render large stretches of

streambed useless for spawning habitat, and reduce the number of wild salmon produced in that stream. Culverts which block stream areas in which juvenile salmon rear may interfere with their feeding and escapement from predators. Culverts which block the passage of juvenile salmon downstream prevent these salmon from reaching the sea and attaining maturity.

8. Harvests of salmon have declined dramatically since 1985. Some stocks of native salmon have become so depleted that the species is listed as threatened or endangered.

9. Where culverts block passage of fish such that adult salmon cannot swim upstream to spawn and juveniles cannot swim downstream to reach the ocean, those blocked culverts are directly responsible for a demonstrable portion of the diminishment of the salmon runs.

10. The depletion of salmon stocks and the resulting diminished harvests have harmed the Tribes and the individual members economically, culturally, and personally. It is not necessary that the Tribes quantify the amount of loss in order to demonstrate their entitlement to relief from further harm.

11. Non-Tribal fishermen have also been injured economically and personally by the diminished salmon harvests.

12. The Eleventh Amendment to the United States Constitution does not bar the plaintiffs' claims for injunctive relief against the State of Washington.

13. Plaintiffs seeking a permanent injunction must satisfy a four-part test before the Court may grant such relief. The Tribes "must demonstrate (1) that [they have] suffered an irreparable injury; (2) that remedies available at law, such as monetary damages, are inadequate to compensate for that injury; (3) that, considering the balance of hardships between the [parties], a remedy in equity is warranted; and (4) that the public interest would not be disserved by a permanent injunction". *Monsanto Co. v. Geertson See Farms, Inc.*, 130 S.Ct. 2743, 2756 (2010).

14. The Tribes have demonstrated, as set forth above in Findings of Fact 6 - 14, that they have suffered irreparable injury in that their Treaty-based right of taking fish has been impermissibly infringed. The construction and operation of culverts that hinder free passage of fish has reduced the quantity and quality of salmon habitat, prevented access to spawning grounds, reduced salmon production in streams in the Case Area, and diminished the number of salmon available for harvest by

1 Treaty fishermen. The Tribes and their individual members have been harmed economically, socially,
2 educationally, and culturally by the greatly reduced salmon harvests that have resulted from State-
3 created or State-maintained fish passage barriers.

4 15. This injury is ongoing, as efforts by the State to correct the barrier culverts have been
5 insufficient. Despite past State action, a great many barrier culverts still exist, large stretches of
6 potential salmon habitat remain empty of fish, and harvests are still diminished. Remedies at law are
7 inadequate as monetary damages will not adequately compensate the Tribes and their individual
8 members for these harms. Salmon harvests are important to Tribal members not only economically but
9 in their traditions, culture, and religion; interests for which there is no adequate monetary relief.

10 16. The balance of hardships tips steeply toward the Tribes in this matter. The promise made to
11 the Tribes that the Stevens Treaties would protect their source of food and commerce was crucial in
12 obtaining their assent to the Treaties' provisions. FF 2; citing *State of Washington v. Washington State*
13 *Commercial Passenger Fishing Vessel Association*, 443 U.S. 658, 677 (1979). Equity favors requiring
14 the State of Washington to keep the promises upon which the Tribes relied when they ceded huge tracts
15 of land by way of the Treaties.

16 17. It was the intent of the negotiators, and the Tribes' understanding, that they would be able to
17 meet their own subsistence needs forever, and not become a burden on the State treasury. Order on
18 Cross-Motions for Summary Judgment, Dkt. # 392, p. 10. The Tribes' ability to meet their subsistence
19 and cultural needs is threatened by the depletion of salmon stocks which has resulted from the continued
20 existence of fish passage barriers. State action in the form of acceleration of barrier correction is
21 necessary to remedy this decline in salmon stocks and remove the threats which face the Tribes. The
22 State has the financial ability to accelerate the pace of barrier correction over the next several years and
23 provide relief to the Tribes. FF 48 - 49; 51 - 59. Under state and federal law, barrier culverts must be
24 corrected in any case. Any marginal costs attributable to an accelerated culvert correction schedule are
25 more than offset by the benefit that will accrue to the Tribes. Increased State spending on barrier
26 correction will not adversely affect state programs such as education or social welfare, because the
27 transportation and general operating budgets are separate. FF 54, 60.

